

“Catalogue of Papers and Works relating to the Mammalian Orders, Marsupialia and Monotremata.” By J. J. Fletcher, M.A., B.Sc. From the Author.

“Scientific Opinion,” 3 Vols., 4to, 1869-70. “Intellectual Observer,” 16 Vols., 8vo, 1862-70. From Professor W. J. Stephens, M.A., F.G.S.

“Proceedings of the Zoological Society of London,” Part 3, for 1884. From the Society.

“Nova Acta Regiæ Societatis Scientiarum Upsaliensis.” Series III., Vol. XII., Fasc. I., 1884, 4to. From the Society.

“Monatliche Mittheilungen des Naturwissenschaftlichen Vereins des Regierungsbezirkes Frankfurt.” Jahrg. II. No. VII., October 1884. From the Society.

“Second Supplement to R. A. Peacock’s ‘Saturated Steam.’” 1 Pamphlet 12 mo. 1884. From the Author.

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PAPERS READ.

OCCASIONAL NOTES ON PLANTS INDIGENOUS IN  
THE IMMEDIATE NEIGHBOURHOOD OF SYDNEY.

No. 8.

BY EDWARD HAVILAND.

The subject of this paper is the plant *Wahlenbergia gracilis*. It belongs to the order *Campanulaceæ*.

This order, although abundant in genera in most other countries, contains, so far as is yet known, but three in Australia. Bentham (*Flora Australiensis*, Vol. IV.) gives four, *Lobelia*, *Pratia*, *Isotoma*, and *Wahlenbergia*; but Baron von Mueller (*census Australian Plants*, 1882) reduces them to three by uniting *Pratia* and *Lobelia*. Of the genus *Wahlenbergia*, there is but one species, *Wahlenbergia gracilis*, as yet known in New South Wales; and this appears in all the Australian colonies, while in Tasmania there are two, *W. gracilis* and *W. saxicola*; both species being also found in New Zealand. The genus seems to be almost uninfluenced by climate. Bentham mentions *W. gracilis* as being

common from the coast to the mountains, being found even at a height of six thousand feet; while *W. saxicola* is stated by Hooker to be found on the coast and also on the summit of Mount Wellington, in Tasmania. *Wahlenbergia gracilis* is an exceedingly variable plant, both in its general stature and in the size of its individual flowers. Mature specimens may be collected side by side, varying from six to eighteen inches in height, and with corollas from two or three lines to three quarters of an inch in diameter. It seems to prefer light open forest land, and in such localities it has been exceedingly abundant during the present spring and summer. In all its forms it is an exceedingly graceful plant; its beautiful blue flowers, when seen at a little distance, bringing at once to memory the English Harebell (*Campanula rotundifolia*), though of course a very different plant when more closely inspected. *Wahlenbergia gracilis* presents a peculiarity, when quite mature, in the apparent loss of its stamens. It is but apparent, however, their peculiar form, together with the early loss of the anthers, lead often to the supposition that the flower has no stamens; but I have not found them altogether absent in any specimen that I have examined. In nearly all, however, after the flowers have reached maturity the anthers have been wanting. The ovary has its dome shaped top level with the bases of the calyx lobes, and the fine stamens have the lower portions of their filaments so broad, that during the early existence of the flower, when they lie flatly upon the ovary, they cover it so closely that they are scarcely distinguishable from it; and as the edges of these broad portions of the filaments are ciliate, the top of the ovary, at that time, presents the appearance of a flattened dome having five ridges extending downwards from its apex. As the flower reaches maturity the filaments become loose, standing more away from the ovary; but looking more like an inner perianth than stamens. Although so broad at the base they end abruptly in a very fine thread-like portion, as long as the broader part, having, through the loss of the anthers the appearance of staminodia, hence the flower appears either to have no stamens or imperfect ones.

If a bud, just before it expands, be opened, the anthers may be seen attached to the almost hair-like portion of the filament ; and forming a close tube round the style, which at that time is only level with them, although it subsequently passes through them, and grows to a considerable length beyond them. Upon the style there are several large glands and these secrete a viscid fluid causing the pollen, which has already escaped from the anthers, to adhere to it. The style ends in a stigma of three lobes which at this time are closed, the stigmatic surfaces being inside, so that the pollen that has been deposited can have no fertilising effect upon the flower. Soon after the anthers have thus shed their pollen, as a rule, they disappear, by what means, I am at present unable to say. My first impression was that they were carried away by insects with some pollen still in them. Our friend Mr. Deane however, who has rendered me very great assistance in the study of this plant, suggested, that becoming detached they simply fall out of the corolla by gravity. I am not able to satisfy myself that this is the case ; because, if it were so, I should expect the anther always to be detached at the connective. I find however that this is not so ; but that on the contrary, although sometimes so detached, they are more frequently so by the rupture of the thinner portion of the filament at various points ; and moreover I find that when the filament itself is so broken, the remaining portion always seems to have recoiled, as though from a violent rupture. I do not think the anthers fall from mere gravity, for the flower, although so fragile, is generally quite erect when expanded, becoming pendant only as it closes, thus imprisoning the anthers at the very time when it could fall out by gravity. On this account I have searched for the debris of anthers in the bottom of the corolla but have have found it only in exceptional instances.

I think, however, another suggestion of Mr. Deane's a very happy one, and likely to be the solution of the difficulty. To explain this, I must repeat, that when the bud first opens the anthers and the thin portions of the filaments lie closely round the style, and are to some extent cemented to it by the viscid secretion from its glands. From that time the style grows very rapidly, passing far beyond

the stamens. Mr. Deane suggests that this rapid growth of the style, carrying the stamens for a time with it, causes such a strain upon them that the thin portions of the filaments are ruptured. Of course this rupture may occur in any part of the filament, and this is just what I find, sometimes at the connective, at other times lower down and even close to the broader base. The suggestion however, though in all probability right, lacks confirmation by actual observation.

When the style has grown far above the anthers it exposes a large mass of pollen adherent to it. In a few days, as a rule, the whole of this pollen disappears. It does not fall into the corolla, nor can it I think be carried away by the wind, as it is not of the dry dusty nature of the pollen of *anemophilous* flowers. I can therefore only conclude that it is carried away by insects for the fertilisation of other flowers.

It rarely happens that the stigmatic lobes open before the whole of the pollen has been so carried away; then however they open widely, forming a convenient stage upon which an insect may alight, and exposing freely the stigmatic surfaces, densely covered with stiff hair-like glands; which, at the same time, form a brush to sweep the pollen from any insects bearing it, and secrete a fluid to retain it. Thus, like *Lobelia*, in the same natural order of plants, although somewhat in a different way, this plant first offers its own pollen for the fertilisation of other plants, and then exposes its own stigmas to receive that of other plants in return.